American Mineralogist, Volume 59, pages 208–212, 1974

New Mineral Names*

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Armstrongite*

N. V. VLADYKIN, V. I. KOVALENKO, A. A. KASHAEV, A. N. SAPOZHNIKOV, AND V. A. PISARSKAYA. A new silicate of calcium and zirconium, armstrongite. *Dokl. Akad. Nauk SSSR,* **209,** 1185–1188 (in Russian).

Analysis by V. A. P. gave SiO_2 60.12, ZrO_2 19.80, TiO_2 0.12, Al_2O_3 0.60, Fe_2O_3 1.31, $\Sigma TR_2O_3 + Y_2O_3$ 0.55, MgO 0.19, CaO 9.15, Na_2O 0.18, K_2O 0.14, P_2O_5 0.20, H_2O total 7.90, sum 100.26 percent, corresponding to $CaZrSi_6O_{15}\cdot 2.5H_2O$. Spectrographic analysis showed Pb 0.01, Ag 0.01, Ce 0.001, Ba 0.001; X-ray spectrographic analysis showed HfO_2 1.27, Nb_2O_5 0.001 percent. The rare earths were determined by paper chromatography to consist of La_2O_3 2.8, CeO_2 8.8, Pr_2O_3 0.9, Nd_2O_3 3.8, Sm_2O_3 0.7, $Gd_2O_3 + Eu_2O_3$ 1.3, $Tb_2O_3 + Y_2O_3$ 55.8, Dy_2O_3 3.8, Ho_2O_3 1.4, Er_2O_3 6.8, Tm_2O_3 2.9, Yb_2O_3 9.2, Lu_2O_3 1.8 percent. DTA study by I. L. Latsides showed an exothermic[1] effect at 500°, corresponding to loss of water, and an endothermic[1] effect at 950°, perhaps due to a transition. The mineral is not attached by HCl or HNO_3, decomposed by HF.

X-ray study showed the mineral to be monoclinic. *a* 14.04, *b* 14.16, *c* 7.81 Å., β109°33′, space group symmetry *C*2/*m*, *Cm*, or *C*2, Z = 4, G. calc 2.71, det 2.562–2.593, av. 2.58. There are pseudoperiods a′ = 7.02 Å., b′ ≠ 7.08 Å. The strongest X-ray lines (35 given) are 7.05 (5)(020), 6.60 (9)(200), 4.26 (10)($20\bar{1}$), 3.80 (9)($20\bar{2}$), 3.05 (10)($24\bar{1}$), 2.995 (5)(420), 1.947 (5)(204).

Color brown, luster vitreous. Very brittle, microhardness 310–330 kg/sq. mm, hardness 4.6. Cleavages {001} perfect, {100} average. Optically biaxial, negative, *ns* α1.563, β1.569, γ1.573, $r < v$, $Z = b$, $Y \wedge c = 5$–7°, 2*V* not given. Twinning polysynthetic.

The mineral occurs in poikilitic crystals up to 2 cm in size and in aggregates up to 50 × 50 cm in schlieren of alkali granite pegmatite of the Khan-Bogdinskii massif, Mongolia; which are at the contact of arfvedsonite granite with xenoliths of acid volcanic rocks. The pegmatite consists of quartz, microcline, albite, aegirine, and arfvedsonite, with accessory monazite, synchysite, sphene, and titanosilicates.

The name is for Neil A. Armstrong, American astronaut, first man on the moon's surface.

Eylettersite*

L. VAN WAMBEKE (1972) Eylettersite, un nouveau phosphate de thorium appartenant à la série de la crandallite. *Bull. Soc. Franc. Mineral. Cristallogr.* **95,** 98–105.

Analyses of samples containing a little autunite, apatite, limonite, and cyrtolite gave P_2O_5 18.3, 19.72; ThO_2 18.43, 20.10; UO_3 3.05, 3.10; CaO 0.72, 0.55; BaO 1.45, 1.90; SrO 0.1, 0.2; PbO 4.62, 3.11; Al_2O_3 35.7, 34.9; Fe_2O_3 0.09, 0.1; ZrO_2 0.95, 1.0; CO_2 0.2, 0.1, SiO_2 1.65, 1.20; H_2O 15.0, 14.4, sum 100.26, 100.38 percent. After deducting impurities, these correspond to

$$(Th_{0.36}Pb_{0.11}Ba_{0.05}U_{0.04}Cu_{0.01}Sr_{0.01}H_{0.17})Al_{3.58}[(PO_4)_{1.27}(SiO_4)_{0.13}(CO_3)_{0.03}(H_4O_4)_{0.575}](OH)_{6.10}, \text{ and}$$

$$(Th_{0.39}Pb_{0.07}Ba_{0.06}U_{0.04}Ca_{0.02}Sr_{0.01}H_{0.17})Al_{3.50}[(PO_4)_{1.39}(SiO_4)_{0.09}(CO_3)_{0.01}(H_4O_4)_{0.09}],$$

which may be compared to formulas for the crandallite group, $A^{2+}B_3(PO_4)_2(OH)_5\cdot H_2O$ and $A^{3+}B_3(PO_4)_2(OH)_6$. It will be noted that there is a considerable deficiency in the *A* position and that replacement of SiO_4 by (H_4O_4) is assumed. The mineral is readily dissolved by H_2SO_4. The DTA curve shows a large endothermic break with maximum 165–170° and 2 exothermic peaks at 730–740° and 830°. Heated material gives X-ray lines of ThO_2, U_3O_8, Al_2O_3, and aluminum pyrophosphate (?).

The X-ray pattern is indexed on a rhombohedral cell, space group $R\bar{3}m$, unit cell (hexagonal setting) of the analyzed samples: *a* 6.99, 6.98; *c* 16.70, 16.66 Å., resp., G. calc 3.44 3.50, meas 3.38, 3.44 (each ± 0.1). The strongest lines (10 given) are 5.70 (55)(101), 3.51 (60)(110), 2.95 (100)(015, 113, 021), 2.187 (40)(116, 107), 1.899 (30)(033, 303).

Color white to creamy. Nearly isotropic to uniaxial, probably negative, mean *n* 1.61–1.66, mostly about 1.635. Fluoresces weakly in U.V., brown-cream in long wave, greenish-yellow in short wave.

The mineral occurs in nodules in the Kobokobo pegmatite, Kivu, Congo Republic (Kinshasa), associated with feldspar, cyrtolite, columbite, apatite, and phosphuranylite.

The name is for the author's wife. Type material is preserved at Euratom, Ispra, Italy.

Galkhaite*

V. S. GRUDZEN, V. I. STEPANOV, N. G. SHUMKOVA, M. M. CHERNITSOVA, R. N. YUDIN, AND I. A. BRYZGALOV (1972). Galkhaite, $HgAsS_2$, a new mineral from arsenic-antimony-mercury deposits of the USSR. *Dokl. Akad. Nauk SSSR,* **205,** 1194–1197 (in Russian).

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* Minerals marked with an asterisk after the name were approved before publication by the Commission on New Minerals and Mineral Names, International Mineralogical Association.

[1] The DTA curve given shows an *endothermic* effect at 500° and an *exothermic* effect at 950° (M.F.).

Analyses from Gal-Khaya (contains a little pyrite) and Khaidarkan deposits gave, resp., Hg 47.60, 49.02; Cu 3.49, 2.85; Zn 3.00, 0.60; Tl 0.46, 2.90; As 23.60, 19.49; Sb 0.59, 5.51; S 21.00, 19.31; Sc 0.0003, 0.015; Fe 0.31, none; Mn none, none; sum 100.05, 99.70 percent, corresponding to $(Hg_{0.74}\ Cu_{0.17}\ Zn_{0.14}\ Tl_{0.01})\ (As_{0.98}Sb_{0.02})S_{2.01}$, and $(Hg_{0.80}Cu_{0.15}Zn_{0.07}Tl_{0.05})(As_{0.85}Sb_{0.15})S_{1.97}$. The mineral is insoluble in acids or alkalies, dissolved by aqua regia. Not etched by most reagents, but treatment with concentrated KOH gives a dark film (distinction from realgar, which is dissolved).

X-ray study shows the mineral to be cubic, $I4\bar{3}m$, a 10.41 ± 0.01 Å, $Z = 12$, G. calc (Gal-Khaya) 5.44, meas 5.4; (Khaidarkan calc 5.75, meas 5.7). The strongest lines (83 given) are 7.40 (50)(110), 4.27 (70)(211), 3.01 (100)(222), 2.78 (80)(321), 2.004 (29)(400), 1.841 (50)(440), 1.569 (29)(622).

Color dark orange-red, streak orange-yellow, luster vitreous to adamantine. H. 3, microhardness 171–205, av. 190 kg/sq mm. Fracture uneven to fine conchoidal, brittle. In reflected light pale gray with a bluish-lilac tint, strong orange-red internal reflections. Isotropic, n (Gal-Khaya) 2.92 at 472 nm, 2.77 at 5.79, 2.60 at 970; (Khaidaikan) 3.09, 2.82, 2.62 at these wave lengths; reflections at these wave lengths: Gal-Khaya 26.1, 22.6, 19.9; Khaidaikan 27.8, 22.9, 20.1 percent.

The mineral occurs as idiomorphic crystals up to 1 cm, their aggregates, and as granular aggregates in the mercury deposits of Gal-Khaya, Yakutia, and Khaidaikan, Kirgizia. Associated minerals include pyrite, stibnite, cinnabar, metacinnabar, aktashite, wakabayashilite, orpinent, realgar, getchellite, calcite, fluorite, quartz, and others. It is replaced in places by cinnabar and metacinnabar.

The name is for the locality. Type material is at the Mineralogical Museum, Acad. Sci. USSR, Moscow.

Haxonite*

E. R. D. SCOTT (1971) New carbide $(Fe,Ni)_{23}C_6$, found in iron meteorites. *Nature, Phys. Sci.* **229,** 61–62.

Electron microprobe analysis from Canyon Diablo meteorite gave Fe 89.5, Ni 4.91, Co 0.18, Cr and Cu less than 0.05 percent, C (diff.) 5.4, corresponding to $(Fe, Ni)_{23}C_6$.

X-ray study shows the mineral to be cubic, a 10.55 Å, $Z = 4$, G. calc 7.70. The strongest lines (18 given) are 2.356 (5)(420), 2.151 (5)(422), 2.03 (overlapped by kamacite), 1.80 (overlapped by taenite), 1.242 (m)(822, 660). The pattern is very close to that of synthetic $Cr_{23}C_6$ (a 10.66 Å).

The mineral occurs in many meteorites, including Canyon Diablo, Toluca, Edmonton, and Tazewell, in forms up to 40 microns in diameter.

Note

The name haxonite is not given in the paper cited, but has been published in an abstract of it in *Mineral. Abstr.* **32,** 49 (1972). The name, for H. J. Axon, metallurgist, University of Manchester, was approved by the Commission early in 1971.

Irhtemite*

ROLAND PIERROT, AND HENRI-JEAN SCHUBNEL (1972). L'irhtemite, un nouvel arséniate hydraté de calcium et magnesium. *Bull. Soc. Franc. Mineral. Crystallogr.* **95,** 365–370.

Analysis by J. Fritsche of material prepared by partial dehydration of picropharmacolite gave As_2O_5 55.5, CaO 28.2, MgO 4.4, H_2O 11.5, sum 99.6 percent, corresponding to $CaO:MgO:As_2O_5:H_2O = 4.16:0.90:2:5.28$. A DTA curve of irhtemite showed an endothermic break at 300° and an exothermic break at 730°. The mineral is dissolved by dilute acids. Readily synthesized by gently heating picropharmacolite or by hydrolysis of basic arsenates.

X-ray powder data are indexed on a monoclinic unit cell with a $16.73_6 \pm 0.005$, b $9.48_3 \pm 0.003$, c $10.84_0 \pm 0.005$ Å, β 97°15′ ⫤ 20′, $Z = 4$, G. calc 3.153, meas 3.09 ± 0.02. The strongest lines (24 given) are 5.08 (4)$(\bar{3}01)$, 3.70 (4)(410), 3.242 (9)$(\bar{4}12)$, 2.963 (10)(213), 2.847–2.842 (9)(322, 511).

Color white to pale rose, in spherulites 0.5–1 mm in diameter, luster silky, and as colorless crystals. Optically biaxial, positive, α 1.634, γ' 1.642, elongation negative, extinction angle 25°.

The mineral occurs in the Irhtem and Bou Azzer ore deposits, Morocco, associated with sainfeldite and erythrite; it was probably formed by the dehydration of picropharmacolite. The name is for the locality. Type material is preserved at the École Nat. Supérieure des Mines, Paris.

Kafehydrocyanite

A. S. POVARENNYKH, AND L. D. RUSAKOVA (1973) The new mineral kafehydrocyanite: *Geol. Zhurn. (Ukraine),* **33,** 24–30 (in Russian).

Analysis by I. B. Nikitina (CN by P. F. Ol'khorich) gave K 40.87, Fe 14.26, (CN) 39.23, H_2O 4.98, corresponding to $K_{4.1}Fe_{1.0}(CN)_{5.91}\cdot 1.08H_2O$, or $K_4Fe(CN)_6\cdot 1H_2O$. Spectrographic study showed traces of Na, Ca, and Mg. DTA and TGA curves are given; the DTA curve shows endothermic peaks at 150° and 700°. When heated the mineral decomposed to $KCN + Fe(CN)_2$; the latter decomposed further to $FeC_2 + N_2$. The mineral is appreciably soluble in H_2O.

Laue diagrams gave smeared spots not permitting measurements. X-ray powder data are given (24 lines). These correspond to lines of $K_4Fe(CN)_6\cdot 3\ H_2O$ (a) (XRDC–1–4695) and $K_4Fe(CN)_6$ (b) (XRDC–1–0877). The strongest lines of the mineral are: 4.80 (8), 3.62 (7)(b), 3.12(5)(b), 2.93 (10)(a, b), 2.83 (5)(b), 2.79 (5)(a), 2.21 (8)(b), 2.10 (6b)(b). 1.796 (5)(b). The infra-red spectrum corresponds with bands of both the trihydrate and anhydrous salts.

The mineral has been found in the gold deposits of Medvezhii Log, Olkhovsk ore field, eastern Sayan, in the Saralinsk and the Kaliovstrosk deposits, Kuznets Alatau, in the Sinyakhinsk skarn deposit, Gornyi Altai, and in the Blyava copper-pyrite deposit, southern Urals. It occurs abundantly at Medvezhii Log as pale yellow-green stalactites, between melanterite and gypsum, around pyrite-pyrrhotite ore, also as incrustations in mine workings, in intergranular cavities. The mineral generally forms aggregates, consisting of crystallites 0.2–1.5 mm., mainly square and rectangular plates; some of the intergrowths have pyramidal forms, some have monoclinic aspect.

Color lemon-yellow, paler when partly dehydrated. H. 2–2.5, G 1.98. Cleavage {001}. Optically uniaxial positive, ω 1.577, ε 1.584.

The name is for the composition, *ka*lium + *fe*rrum + *hydro* + *cyan*.

Discussion

The authors state, "There still remain some puzzling questions on the source of the cyanide group. There is no doubt that it is introduced by surface waters from soil layers rather rich in organic matter. One thing is perfectly evident: there is no relation to technological activity of man, for example, the process of cyanidation of gold, to the formation of kafehydrocyanite, and in some of the deposits (Blyava), cyanidation of the ores is not generally done." The authors also mention that other ferrocyanides, ferricyanides, thiocyanates, and oxalates occur in these deposits but have not yet been characterized.

Nevertheless, one must regard the 'natural" origin of this new mineral and new class of minerals as unproved (just like that of julienite, the only reported thiocyanate). It is regrettable that the description was published without being submitted to the Mineral Name committees of the Russian Mineral Society or the International Mineralogical Association.

Kanemite*

Zdenek Johan, and G. F. Maglione (1972) La kanemite, nouveau silicate de sodium hydraté de néoformation. *Bull. Soc. Franc. Mineral. Cristallogr.* **95**, 371–382.

Analysis by G. Krempp of a sample washed with water to remove trona, then dried, gave SiO_2 56.68, Al_2O_3 0.40, CaO 0.20, Na_2O 13.25, K_2O 0.10, H_2O (to 170°) 16.30, H_2O (170–280°) 8.45, H_2O (above 280°/4.25, sum 99.63 percent, corresponding to

$$(Na_{0.93}K_{0.97})H_{1.03}(Si_{2.06}Al_{0.01})O_{4.13}(OH)_{2.04}\cdot 1.97\ H_2O, \text{ or}$$

$$NaH(SiO_4)(OH)_2\cdot 2\ H_2O.$$

With 0.1 N HCl, all the Na is removed from kanemite, leaving a hydrated silica of formula $H_2Si_2O_5$ (X-ray pattern given). The DTA curve is similar to that of makatite with a large double endothermic break with peaks at 160 and 220°, a small endothermic break at 600°, and an exothermic break at 655°. The minimal had been synthesized by Kalt (1968) by reaction of NaOH + $H_2Si_2O_5$; he ascribed the formula of $NaHSi_2O_5\cdot H_2O$ to it. The infrared spectrum is given.

Rotation and Weissenberg photographs show kanemite to be orthorhombic, space group *Pnmb*, *a* 7.282 ± 0.002, *b* 20.507 ± 0.005, *c* 4.956 ± 0.001Å., G calc 1.933, meas 1.926 ± 0.004. The strongest lines (48 given) are 10.33 (10)(020), 5.133 (5)(040), 4.014 (10)(111), 3.636 (5) (200), 3.435 (9)(220), 3.162 (7)(051), 3.093 (7)(160), 2.480 (8)(002), 2.386 (6)(171), 1.995 (5)(062, 191).

The mineral is colorless to white. Cleavages {010} perfect, {100} good. H. 4. Optically biaxial, negative, *ns* (Na) α 1.451, β 1.470, γ 1.478 (all ±0.002). $X = b$, $Y = a$, $2V$ 46 ± 2°, $r > v$.

The mineral occurs as spherulitic aggregates of diameter 1.5–2mm, associated with gaylussite, in masses of trona in the interdunary depression of Andija, Kanem region, northeastern edge of Lake Chad, Africa.

The name is for the region. Type material is preserved at the École National Supérieure des Mines, Paris.

Krutaite*

Zdenek Johan, Paul Picot, Roland Pierrot, and Milan Kvacek (1972) La krutaite, $CuSe_3$, un nouveau minéral du groupe de la pyrite. *Bull. Soc. Franc. Mineral. Cristallogr.* **99**, 475–481.

Electron microprobe analyses of 2 samples by R. Giraud gave Cu 20.6, 21.5; Co 4.8, 5.5; Ni 1.5, 4.5; Fe 0.6, 0.5; Hg 0.2, 0.2, Se 69.5, 67.1, sum 97.2, 99.3 percent, corresponding to $(Cu_{0.74}Co_{0.18}Ni_{0.08}Fe_{0.03})Se_{1.99}$ and $(Cu_{0.74}Co_{0.20}Ni_{0.17}Fe_{0.02})Se_{1.87}$, or $(Cu, Co, Ni)Se_2$.

X-ray study showed the mineral to be cubic, *Pa*3, *a* 6.056 Å, $Z = 4$, G. calc 6.53. (For synthetic compounds, $CuSe_2$ 6.117, $CoSe_2$ 5.856, $NiSe_2$ 5.960, $FeSe_2$ 5.786 (Bither *et al* (1968) *Inorg. Chem.* **7**, 2208. The strongest lines (10 given) are 3.023 (9)(200), 2.712 (10)(210), 2.477 (8)(211), 1.827 (6)(311). The mineral is a member of the pyrite group.

In reflected light gray with a slight bluish tint, in immersion clear gray to creamy. Isotropic, but some zones rich in Co and Ni are anisotropic. Reflectances are given at 14 wave lengths (4200–6800 mm): 4600, 41.5; 5400, 41.4; 5800, 42.5; 6400, 44.6 percent. Microhardness (25 g load) 243–258, av. 248 kg/sq mm or near 4 on the Mohs scale.

The mineral occurs in crystals up to a few tenths of a mm in size in ores of the Petrovice deposit, eastern Moravia, Czechoslovakia, associated with berzelianite, umangite, clausthalite, klockmannite, eskebornite, ferroselite, pitchblende, hematite, in dolomite-calcite gangue.

The name is for Dr. Thomas Kruta, Director of the Mineralogical Laboratory of the Moravian Museum, Brno, Czechoslovalia. Type material is preserved at the École National Supérieure des Mines, Paris.

Metalodevite*

Henri Agrinier, Francis Chantret, Jacques Geffroy, B. Héry, Bernard Bachet, and Hélène Vachey (1972) Une nouvelle espèce minérale: La méta-lodèvite (arséniate hydraté d'uranium et de zinc). *Bull. Soc. Franc. Mineral. Cristallogr.* **95**, 360–364.

Microchemical analysis on 30 mg gave UO_3 50.1, As_2O_5 19.0, P_2O_5 0.70, ZnO 5.95, FeO 0.58, H_2O 15.70, insol. 7.40, sum 99.43 percent, corresponding to $UO_3 : (As_2O_5 + P_2O_5) : (ZnO + FeO) : H_2O = 2.00 : 1.00 : 0.93 : 9.96$, or $Zn(UO_2)_2(AsO_4)_2\cdot 10\ H_2O$. The mineral is dissolved by cold dilute HCl or HNO_3.

X-ray study showed the mineral to be tetragonal, space group $P4_2/m$, *a* 7.16, *c* 17.20 Å. G. calc 4.00. The strongest lines (16 given) are 8.66 (70)(002), 5.09 (40)(110), 3.59 (100)(020), 3.50 (30)(021), 2.98 (60)(122), 2.545 (30) (220), 2.288 (30)(032).

Color pale yellow to olive. Crystals are less than 0.2 mm, platy on [001]. Optically biaxial negative, $2V$ 27–37°, *ns* (Na) α 1.615 ± 0.005, β 1.635 ± 0.002, γ 1.638 ± 0.002, *X* light brownish, *Y* and *Z* very pale yellow. Fluoresces weakly in U.V. yellow-green.

The mineral occurs in very small amounts in the zone of oxidation of the Rivieral deposit near Lodève, France; the primary ore contains pitchblende, arsenopyrite, sphalerite, pyrite, and coffinite. The name is for the town of Lodève. Type material is preserved at the Commission à l'energie atomique, Fontenay-aux-Roses, France.

Paraboleite

A. Mücke (1972) die Mineralieu der Boleit-Grupye Fortschi. *Mineral.* **50,** 67–68 (abstract).

Paraboleite is defined as including all intermediate members from boleite to pseudoboleite, listed as follows:
Boleite, tetragonal, $P4_2/mmc$, a 15.272, c 30.646 Å.
Paraboleite, tetragonal, —, a 15.249, c 30.831 Å.
Pseudoboleite, tetragonal, $P4_2/mnc$, a 30.46, c 30.81 Å.
Boleite, $27\,PbCl_2 \cdot 24\,Cu(OH)_2 \cdot 9\,AgCl \cdot 3\,H_2O$, $Z = 2$.
Paraboleite, $28\,PbCl_2 \cdot 24\,Cu(OH)_2 \cdot 6\,AgCl \cdot 8\,H_2O$, $Z = 2$.
Pseudoboleite, $28\,PbCl_2 \cdot 24\,Cu(OH)_2 \cdot 2\,AgCl \cdot 15\,H_2O$, $Z = 8$.

Paraboleite is listed as occurring at Mina Santa Ana, Chile.

Discussion

Should not have been named.

Stumpflite*

Zdenek Johan, and Paul Picot (1972) La stumpflite, Pt (Sb, Bi), un nouveau minéral. *Bull. Soc. Franc. Mineral. Cristallogr.* **95,** 610–613.

A partial description of this mineral was given by Stumpfl (1961; abstr. *Am. Mineral.* **46,** 1518). A new microprobe analysis gave Pt 57.0, Sb 26.1, Bi 16.3, sum 99.4 percent, corresponding to $Pt(Sb_{0.73}, Bi_{0.27})$.

X-ray powder data are indexed on a hexagonal cell of NiAs-type, a 4.175, c 5.504 (both ± 0.002 Å), $Z = 2$, G. calc 13.52. The strongest lines (12 given) are 3.618 (6) (100), 3.027 (10)(101), 2.192 (10)(102), 2.088 (8)(110), 1.512 (5)(202), 1.149 (5)(114).

Color cream in reflected light, polishes well. Reflectances (max and min) are given at 15 wave lengths (4200–7000 nm): 4600, 54.7, 52.0; 5400, 63.0, 59.3; 5800, 65.7, 61.1; 6600, 69.3, 64.5 percent. Microhardness (50 g load) 385 kg/sq mm, about 4.9 on the Mohs scale.

The mineral occurs in microscopic masses, up to a few tenths of a mm in concentrates from the Driekop mine, Transvaal. The name is for Professor E. F. Stumpfl, University of Hamburg. A single polished section is preserved at the Bur. Rech. Geol. Minière, Orleans, France.

Wyllieite*

Paul B. Moore, and Jun Ito (1973) Wyllieite, $Na_2Fe^{+2}_2Al(PO_4)_3$, a new species. *Mineral. Rec.* **4,** 131–136.

Wet chem. analysis by J. I. and electron probe analysis by G. R. Zechman gave, resp., P_2O_5 43.8, 45.27; SiO_2 0.8, 0.0; Fe_2O_3 0.33, n.d.; Al_2O_3 7.9, 8.46; ZnO 0.04, n.d.; FeO 29.2, 29.9; MgO 1.97, 1.80; MnO 4.3, 3.62, CaO 2.5, 2.21; Na_2O 8.0, 9.75; K_2O 0.05, 0.0; Li_2O 0.01, n.d., H_2O^+ 0.70, n.d., sum 99.56, 100.99 percent. Calorimetric determination by W K. Sabine gave 0.47 percent H_2O^+. Spectrographic study showed traces of Sr, Ba, Pb, Be. From these the unit cell contains: $H_{1.44}Na_{5.26}Ca_{0.77}Mg_{0.86}Mn_{1.03}Fe_{7.58}Al_{2.96}P_{11.57}O_{46.95}$, or $(Na, Ca, Mn)_2(Fe, Mg)_2(Al, Fe^{+2})(PO_4)_3$, $Z = 4$, with the end-member as given in the title.

Study of the dehydration in a N atmosphere (DTA ?) showed peaks at 525° (loss of 81.6% of total water), 775° (loss of 14.8% water), and at 955–1040° (3.6% of water, melting ?).[2]

X-ray study shows wyllieite to be monoclinic, $P2_1/n$, a 11.868, b 12.382, c 6.354 Å., β 114.52°, G. 3.601 calc; 3.60 (Berman balance). The strongest lines (46 given) are 6.15 (6)(020), 3.449 (5)(310), 2.693 (10)(400), 2.674 (10) (240), 2.498 (5)($\bar{1}32$, 112).

Color deep bluish-green to deep oily-green, gray-green, to greenish-black, luster vitreous to submetallic, streak dirty olive-green. H. 4, very brittle. Cleavages {010} perfect {$\bar{1}01$} distinct. Optically biaxial, pos., ns α 1.688, β 1.691, γ 1.696 (all ± 0.002), $2V \sim 50°$, $r < v$ strong. Thick plates show pleochroism, X smoky blue-gray, Y smoky bluish-green, Z green, abs. $Z > Y > X$.

The mineral occurs in large amounts at the Victory mine pegmatite, Custer County, South Dakota, in masses up to 20 kg, in crude crystals up to 10 cm across and a euhedral crystal 2 × 2 × 3 cm. Associated minerals include arrojadite (rimmed by wyllieite), graftonite, sarcopside, and scorzalite. Wyllieite or related minerals are also noted from the Nickel Plate pegmatite near Keystone, South Dakota, and the Smith Mine, Newport, New Hampshire; some of this had previously been identified as triphylite.

The name is for Professor Peter J. Wyllie of the University of Chicago.

Unnamed Lead Oxychloride

V. L. Mel'nikova (1972) A lead oxychloride from the zone of oxidation of the barite-polymetallic deposit of Kairakty, central Kazakhstan. *Izvest. Akad. Nauk Kazakh. S.S.R., Ser. Geol.* **6,** 82–86 (in Russian).

Analysis by R. I. Zaitseva gave Pb 50.7, PbO 24.6, Cl 17.6, CO_2 4.55, Fe_2O_3 0.12, P_2O_3 0.12, P_2O_5 0.10, SO_3 none, H_2O (total) 2.51, sum 100.18 percent. The DTA curve shows two gradual endothermic effects, one at 175–185°, the second at 370–380°.

The mineral is stated to be orthorhombic, with forms {$\bar{1}01$}, {$20\bar{1}$}, {201}, {010}, {$0\bar{1}0$}; they are elongated on b. However the unit cell is given as a 9.20, b 4.20, c 16.56 Å., β 91°18′. The strongest lines (20 given) are 4.148 (5), 4.028 (8), 2.467 (5), 2.380 (6), 2.326 (10), 2.1105 (9), 2.016 (8), 1.907 (5), 1.516 (5), 1.444 (9).

Color white. H. 3, brittle. Optically biaxial, negative, $2V$ large, ns α' 2.06, β' 2.14, γ' 2.17, elongation positive. Polysynthetic twinning parallel to elongation, extinction at 30° to the turning. Cleavage distinct parallel to b.

The mineral occurs in aggregates at the Kairakty deposit, central Kazakhstan. It is coated by phosgenite, which was present in the analyzed material.

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[2] It is not clear whether the loss in weight was corrected for oxidation of FeO. (M. F.).

Unnamed Uranium Phosphate (?)

W. G. R. DE CAMARGO (1971) Uranium minerals from Perus, São Paulo, Brazil: *Bol. Inst. Geocienc. Astron. Univ. São Paulo,* **2,** 83–201 (in Portugese).

The mineral occurs in acicular crystals with forms {100} and {010} dominant, more rarely {110}, with {111} as terminal faces. The X-ray pattern is indexed on an orthorhombic cell, space group *Bmmb*, with a 15.6 ± 0.1, b 17.28 ± 0.13, c 13.52 ± 0.06 Å., close to data for phosphuranylite. The strongest lines are 7.92 (10)(200), 3.97 (3)(141), 3.82 (3)(232, 410), 3.36 (6)(004, 402). Color yellow, cleavage {001} good, optically biaxial, neg., $2V$ 80°, α 1.680, β 1.732, γ 1.775, $X = a$, colorless, $Y = b$, yellow, $Z = c$, yellow-gold. Fluoresces green in U.V. light.

Spectrographic analysis of material containing quartz showed in decreasing abundance: Si, Mg, Mn, Al, Ti, Fe, Ca. Microchemical tests confirmed Fe, but were doubtful for Ca, negative for Mg, Mn. The composition might be $Mg(UO_2)_4(PO_4)_2(OH)_4 \cdot nH_2O$.

NEW DATA

Hellandite

D. D. HOGARTH, G. Y. CHAO, AND D. C. HARRIS (1972) New data on hellandite. *Can. Mineral.* **11,** 760–776.

A new analysis is given of hellandite from Wakefield Lake, Canada, and X-ray data, optics, and DTA for this and for samples from other localities. The most probable formula is $(Ca, Y)_2(Si, B, Al)_3O_8 \cdot H_2O$. The a cell parameter varies linearly with the number of atoms of Ca per cell.

DISCREDITED MINERALS

Neotantalite = Microlite

MADELEINE GASPERIN (1972) Contribution à l'étude de l'état métamicte: la "neotantalite", une espèce discréditée. *Bull. Soc. Franc. Mineral. Cristallogr.* **95,** 451–457.

Neotantalite (Dana's System, 7th ed., pp. 748, 755) has generally been considered to be a microlite containing appreciable Fe and Mn. Re-examination of type material by electron probe, DTA, TGA, and X-ray study showed that Fe and Mn are not present and the material is a member of the microlite group with a deficiency in the *A* position (Ba, Pb, U, Ca).

Sungulite, Kolskite = mixtures of Lizardite + Sepiolite

V. P. IVANOVA, B. K. KASATOV, AND V. N. MOSKALEVA (1973) Thermographic study of serpentines on heating them to 1400°. *Zapiski Vses. Mineral. Obshch.* **102,** 3–15 (in Russian).

Materials described as "sungulite" or "kolskite", previously considered to be serpentine or antigorite (*Am. Mineral.* **25,** 155–156; **47,** 174) are shown by DTA and X-ray study to be mixtures of lizardite + sepiolite.

ERRATA

Am. Mineral. **58,** 806. γ should be 1.631 for uduminelite.